Attachment 1: Modify RBR AM-1 Text

RBR_id	req_key	req_category	segment	req_type	s_verif_method	s_verif_stat	a_verif_method	a_verif_stat	CCR	text	interpretation text	clarification
AM1-0020#A	8304	mission essential	FOS | CSMS	interface	test	un-verified	test	un-verified	96-1215C	The EOC shall have the capability to send (via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS) and the AM-1 spacecraft shall have the capability to receive spacecraft commands in CCSDS CLTUs (as defined in AM-1 ICD 106).	A: SN Only.	
AM1-0030#A	8305	mission essential	FOS | CSMS	interface	test	un-verified	test	un-verified	96-1215C	The EOC shall have the capability to send (via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS) and the AM-1 spacecraft shall have the capability to receive instrument commands in CCSDS CLTUs (as defined in AM-1 ICD 106).		
AM1-0050#A	8308	mission essential	FOS | CSMS	interface	test	un-verified	test	un-verified	96-1215C	The AM-1 spacecraft shall have the capability to send (in CADU format) and the EOC shall have the capability to receive (in EDUs containing CCSDS telemetry packets and CLCWs) real time AM-1 spacecraft and instrument housekeeping telemetry packets (as defined in AM-1 ICD 106) via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS interfaces.	A: SN Only.	
AM1-1050#A	7865	mission critical	FOS | CSMS	interface	test | analysis	un-verified	test | analysis	un-verified	96-1093	The EOC shall support several uplink rates to the spacecraft, which include at a minimum the following: a. 10 kilobits per second (kbps) (SSA uplink) b. 1 kbps (S-band MA uplink) c. 125 bits per second (bps) (SSA uplink during contingency operations) d. 2 kbps (emergency operations via S-band		

RBR_id	req_key	req_category	segment	req_type	s_verif_method	s_verif_stat	a_verif_method	a_verif_stat	CCR	text	interpretation text	clarification
										~~DSN link~~)		

RBR_id	req_key	Rel	Req_Category	segment	req_type	s_verif_method	s_verif_stat	a_verif_method	a_verif_stat	CCR	text	interpretation text	clarification
AM1-0020#B	6357	B	mission critical	FOS | CSMS	interface	test	un-verified	test	un-verified		The EOC shall have the capability to send (via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS) and the AM-1 spacecraft shall have the capability to receive spacecraft commands in CCSDS CLTUs (as defined in AM-1 ICD 106).		
AM1-0030#B	6360	B	mission critical	FOS | CSMS	interface	test	un-verified	test	un-verified		The EOC shall have the capability to send (via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS) and the AM-1 spacecraft shall have the capability to receive instrument commands in CCSDS CLTUs (as defined in AM-1 ICD 106).		
AM1-0050#B	6361	B	mission critical	FOS | CSMS	interface	test	un-verified	test	un-verified		The AM-1 spacecraft shall have the capability to send (in CADU format) and the EOC shall have the capability to receive (in EDUs containing CCSDS telemetry packets and CLCWs) real time AM-1 spacecraft and instrument housekeeping telemetry packets (as defined in AM-1 ICD 106) via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS interfaces.		
AM1-0070#B	6363	B	mission critical	FOS | CSMS	interface	test	un-verified	test	un-verified		The AM-1 spacecraft shall have the capability to send (in CADU format) and the EOC shall have the capability to receive (in EDUs containing CCSDS telemetry		

RBR_id	req_key	Rel	Req_Category	segment	req_type	s_verif_method	s_verif_stat	a_verif_method	a_verif_stat	CCR	text	interpretation text	clarification
											packets) recorded AM-1 spacecraft and instrument housekeeping telemetry packets (as defined in AM-1 ICD 106) via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS interfaces.		
AM1-0090#B	6365	B	mission critical	FOS | CSMS	interface	test	un-verified	test	un-verified		The AM-1 spacecraft shall have the capability to send (in CADU format) and the EOC shall have the capability to receive (in EDUs containing CCSDS telemetry packets and CLCWs) AM-1 SCC, CTIU, and instrument microprocessor memory dump telemetry packets (as defined in AM-1 ICD 106) via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS interfaces.		
AM1-0150#B	5620	B	mission essential ~~TBD~~	FOS	interface	demo~~TBD~~	un-verified	demo	un-verified		The EOC shall have the capability to send and the SSIM shall have the capability to receive AM-1 spacecraft and instrument commands in CCSDS CLTU format (as defined in AM-1 ICD-106).		
AM1-0160#B	5621	B	mission essential ~~TBD~~	FOS	interface	demo~~TBD~~	un-verified	demo	un-verified		The SSIM shall have the capability to send and the EOC shall have the capability to receive simulated real time AM-1 spacecraft and instrument housekeeping telemetry packets and Command Link Control Words (as defined in AM-1 ICD-106).		
AM1-0200#B	5623	B	mission essential ~~TBD~~	FOS | CSMS	interface	demo~~TBD~~	un-verified	demo	un-verified		The SSIM shall have the capability to send and the EOC shall have the capability to receive simulated AM-1 SCC, CTIU, and		

RBR_id	req_key	Rel	Req_Category	segment	req_type	s_verif_method	s_verif_stat	a_verif_method	a_verif_stat	CCR	text	interpretation text	clarification
											instrument microprocessor memory dump telemetry (as defined in AM-1 ICD-106).		
AM1-0220#B	8698	B	mission essential	CSMS FOS	interface	test	un-verified	test	un-verified	96-1472A	The ECS shall have the capability to provide and the MISR, MOPITT, MODIS, and CERES PIs/TLs shall have the capability to receive IST toolkit software, IST toolkit software upgrades, and IST toolkit documentation.		
AM1-0225#B	7982	B	mission fulfillment	FOS	interface	test	un-verified	test	un-verified	96-0620C	The AM-1 spacecraft vendor shall have the capability to provide and ECS shall have the capability to receive spacecraft analysis tools for implementation and integration into the EOC.		The FOS interfaces with the SAS through the delivery of standard Analysis Carry-out File (refer to the ECS-SAS ICD).
AM1-0230#B	8699	B	mission essential	FOS	interface	test	un-verified	test	un-verified	96-1472A	The IST toolkit shall have the capability to accept data from a science computing facility that supports PI/TL operations, which include the following data (at a minimum): a. instrument microprocessor memory loads. b. changes in the instrument parameters		Instrument parameter changes are input via the IST toolkit user interface.
AM1-0240#B	43	B	mission essential ~~TBD~~	FOS	interface	demo~~TBD~~	un-verified	demo	un-verified		The IST toolkit shall have the capability to provide data to a science computing facility that supports PI/TL instrument operations, which include the following data (at a minimum): a. Microprocessor memory dumps b. Instrument analysis results		
AM1-0280#B	5629	B	mission essential ~~TBD~~	FOS	interface	demo~~TBD~~	un-verified	demo	un-verified		ECS shall have the capability to send and the AM-1 SDVF shall have the capability to		

RBR_id	req_key	Rel	Req_Category	segment	req_type	s_verif_method	s_verif_stat	a_verif_method	a_verif_stat	CCR	text	interpretation text	clarification
											receive AM-1 SCC flight software dumps.		
AM1-0310#B	9187	B	mission essential	FOS	procedural operational	inspection	un-verified	inspection	un-verified	97-0164A	The ECS contractor shall provide and the AM-1 spacecraft vendor shall receive training on operations of the FOS.	M&O will support	
AM1-0315#B	9188	B	mission essential	FOS	procedural operational	inspection	un-verified	inspection	un-verified	97-0164A	The ECS contractor shall provide and the AM-1 instrument teams shall receive training on operations of the IST toolkit.	M&O will support	
AM1-0320#B	9190	B	mission essential	FOS	procedural operational	inspection	un-verified	inspection	un-verified	97-0164A	The AM-1 spacecraft vendor shall provide and the ECS contractor shall receive AM-1 spacecraft operations training.	M&O will support.	
AM1-0330#B	9191	B	mission essential	FOS	procedural operational	inspection	un-verified	inspection	un-verified	97-0164A	The AM-1 instrument teams shall provide and the ECS contractor shall receive AM-1 instrument operations training.	M&O will support.	
AM1-0340#B	5633	B	mission fulfillment~~TBD~~	FOS	interface	demo~~TBD~~	un-verified	demo	un-verified		The AM-1 project shall have the capability to provide and ECS shall have the capability to accept and store AM-1 spacecraft and instrument hardware and software technical documentation.		
AM1-1000#B	5634	B	mission essential ~~TBD~~	FOS | CSMS	interface RMA	analysis~~TBD~~	un-verified	analysis	un-verified		ECS functions shall have an operational availability (computed as defined in the Functional and Performance Requirements Specification for the ECS) of 0.96 at a minimum and a mean down time (MDT) of four (4) hours or less, unless otherwise specified.		
AM1-1010#B	54	B	mission critical~~TBD~~	FOS	interface RMA	analysis~~TBD~~	un-verified	analysis	un-verified		The ECS FOS shall have an operational availability of 0.9998 at a minimum and a MDT of one (1) minute or less for critical real time functions that support:		

RBR_id	req_key	Rel	Req_Category	segment	req_type	s_verif_method	s_verif_stat	a_verif_method	a_verif_stat	CCR	text	interpretation text	clarification
											a. Launch b. Early orbit checkout c. Disposal d. Orbit adjustment e. Anomaly investigation f. Recovery from safe mode g. Routine real time commanding and associated monitoring for spacecraft and instrument health and safety		
AM1-1020#B	55	B	mission essential ~~TBD~~	FOS	interface RMA	analysis~~TBD~~	un-verified	analysis	un-verified		The ECS FOS shall have an operational availability of 0.99925 at a minimum and a MDT of five (5) minutes or less for non-critical real time functions.		
AM1-1050#B	8707	B	mission critical	FOS | CSMS	interface performance	test | analysis	un-verified	test | analysis	un-verified	96-1472A	The EOC shall support several uplink rates to the spacecraft, which include at a minimum the following: a. 10 kilobits per second (kbps) (SSA uplink) b. 1 kbps (S-band MA uplink) c. 125 bits per second (bps) (SSA uplink during contingency operations) d. 2 kbps (emergency operations via S-band ~~DSN link~~)		
AM1-1060#B	5635	B	mission critical~~TBD~~	FOS | CSMS	interface performance	demo~~TBD~~	un-verified	demo	un-verified		The EOC shall be capable of simultaneously receiving all AM-1 telemetry data types.		
AM1-1070#B	3196	B	mission critical~~TBD~~	FOS | CSMS	interface performance	demo~~TBD~~	un-verified	demo	un-verified		The EOC shall provide the capability to receive and process real-time data received as two 16 kbps data streams.		
AM1-1080#B	7983	B	mission critical	FOS | CSMS	interface performance	test	un-verified	test	un-verified	96-0620C	The EOC shall provide the capability to receive and record spacecraft recorder data at rates up to 1.544 Mbps.		This data is received as a rate-buffered file transfer from EDOS.
AM1-	5637	B	mission	FOS |	interface	test	un-verified	test	un-verified		The EOC shall be		

RBR_id	req_key	Rel	Req_Category	segment	req_type	s_verif_method	s_verif_stat	a_verif_method	a_verif_stat	CCR	text	interpretation text	clarification
1090#B			essential ~~TBD~~	CSMS		analysis~~TBD~~		analysis			capable of providing CLTUs to the SSIM at the following data rates: a. 125 bps b. 1 kbps c. 2 kbps d. 10 kbps		
AM1-1100#B	5638	B	mission essential ~~TBD~~	FOS | CSMS	interface performance	demo~~TBD~~	un-verified	demo	un-verified		The EOC shall be capable of receiving two housekeeping telemetry packet streams of 16 kbps from the SSIM.		
AM1-1110#B	5639	B	mission essential ~~TBD~~	FOS | CSMS	interface performance	demo~~TBD~~	un-verified	demo	un-verified		The EOC shall be capable of receiving a health and safety telemetry packet stream from the SSIM at 1 kbps.		
AM1-1120#B	5640	B	mission essential ~~TBD~~	FOS | CSMS	interface performance	demo~~TBD~~	un-verified	demo	un-verified		The EOC shall be capable of receiving a diagnostic telemetry/memory dump packet stream from the SSIM at 16 kbps.		
AM1-1150#B	3202	B	mission critical~~TBD~~	FOS | CSMS	interface_performance	test analysis~~TBD~~	un-verified	test |analysis	un-verified		ECS shall contribute a loop delay of not greater than 2.5 seconds of the total system delay of five (5) seconds for emergency real-time commands, not including the time needed for command execution. The loop delay is measured from the originator to the spacecraft/instrument and back and only applies when a Tracking and Data Relay Satellite System (TDRSS) link is available for contact to the spacecraft.		

Attachment 2: Delete RBRs

RBR_id	req_key	Rel	Req_Category	segment	req_type	s_verif_method	s_verif_stat	a_verif_method	a_verif_stat	CCR	text	interpretation_text	clarification
~~AM1-0170#B~~	~~5622~~	~~B~~	~~mission essential TBD~~	~~FOS | CSMS~~	~~interface~~	~~demoTBD~~	~~un-verified~~	~~demo~~	~~un-verified~~		~~The SSIM shall have the capability to send and the EOC shall have the capability to receive simulated recorded AM-1 spacecraft and instrument housekeeping telemetry packets (as defined in AM-1 ICD-106).~~		
~~AM1-1130#B~~	~~3141~~	~~B~~	~~mission essential TBD~~	~~FOS | CSMS~~	~~interface~~	~~demoTBD~~	~~un-verified~~	~~demo~~	~~un-verified~~		~~The EOC shall be capable of receiving a spacecraft recorder housekeeping telemetry packet stream from the SSIM at 256 kbps or 512 kbps.~~		

Attachment 3: Modify IRD Requirement

IRD_id	req_key	source interface	destination interface	CCR	text
AM1-0020	1034	ECS	AM-1		The EOC shall have the capability to send (via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS) and the AM-1 spacecraft shall have the capability to receive spacecraft commands in CCSDS CLTUs (as defined in AM-1 ICD 106).
AM1-0030	1035	ECS	AM-1		The EOC shall have the capability to send (via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS) and the AM-1 spacecraft shall have the

IRD_id	req_key	source interface	destination interface	CCR	text
					capability to receive instrument commands in CCSDS CLTUs (as defined in AM-1 ICD 106).
AM1-0050	1036	AM-1	ECS		The AM-1 spacecraft shall have the capability to send (in CADU format) and the EOC shall have the capability to receive (in EDUs containing CCSDS telemetry packets and CLCWs) real time AM-1 spacecraft and instrument housekeeping telemetry packets (as defined in AM-1 ICD 106) via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS interfaces.
AM1-0070	1037	AM-1	ECS		The AM-1 spacecraft shall have the capability to send (in CADU format) and the EOC shall have the capability to receive (in EDUs containing CCSDS telemetry packets) recorded AM-1 spacecraft and instrument housekeeping telemetry packets (as defined in AM-

IRD_id	req_key	source interface	destination interface	CCR	text
					1 ICD 106) via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS interfaces.
AM1-0090	1038	AM-1	ECS		The AM-1 spacecraft shall have the capability to send (in CADU format) and the EOC shall have the capability to receive (in EDUs containing CCSDS telemetry packets and CLCWs) AM-1 SCC, CTIU, and instrument microprocessor memory dump telemetry packets (as defined in AM-1 ICD 106) via EDOS/EBnet and the SN, AGS, SGS~~GN, DSN~~, or WOTS interfaces.
AM1-1050	240	ECS	AM-1		The EOC shall support several uplink rates to the spacecraft, which include at a minimum the following: a._10 kilobits per second (kbps) (SSA uplink) b._1 kbps (S-band MA uplink) c._125 bits per second (bps) (SSA uplink during contingency operations) d._2 kbps (emergency

IRD_id	req_key	source interface	destination interface	CCR	text
					operations via S-band ~~DSN link~~)

Attachment 4: Delete IRD Requirement

IRD_id	req_key	source interface	destination interface	CCR	text
~~AM1-0170~~	~~756~~	~~AM-1 SSIM~~	~~ECS~~		~~The SSIM shall have the capability to send and the EOC shall have the capability to receive simulated recorded AM-1 spacecraft and instrument housekeeping telemetry packets (as defined in AM-1 ICD-106).~~
~~AM1-1130~~	~~248~~	~~AM-1 SSIM~~	~~ECS~~		~~The EOC shall be capable of receiving a spacecraft recorder housekeeping telemetry packet stream from the SSIM at 256 kbps or 512 kbps.~~

Attachment 5: Add RBR/L4 Links

RBR_id	L4_id
AM1-0020#B	F-CMD-01120
AM1-0020#B	F-CMD-01160
AM1-0030#B	F-CMD-01120
AM1-0030#B	F-CMD-01160
AM1-0030#B	F-CMD-01125
AM1-0030#B	F-CMD-01130
AM1-0030#B	F-CMD-01135
AM1-0050#B	F-CMD-02125
AM1-0090#B	F-CMD-02125
AM1-0090#B	F-TLM-00110
AM1-0090#B	F-TLM-10575
AM1-0120#B	F-FOS-00085
AM1-0120#B	F-FOS-00035
AM1-0120#B	F-FOS-00155

RBR_id	L4_id
AM1-0125#B	F-FOS-00085
AM1-0125#B	F-FOS-00035
AM1-0125#B	F-FOS-00155
AM1-0125#B	F-CMD-02125
AM1-0130#B	F-TLM-01520
AM1-0130#B	F-TLM-01510
AM1-0130#B	F-FOS-00085
AM1-0130#B	F-FOS-00035
AM1-0130#B	F-FOS-00155
AM1-0135#B	F-TLM-00110
AM1-0135#B	F-TLM-10555
AM1-0135#B	F-TLM-10575
AM1-0135#B	F-FOS-00085
AM1-0135#B	F-FOS-00035
AM1-0135#B	F-FOS-00155
AM1-0140#B	F-FOS-00085
AM1-0140#B	F-FOS-00035
AM1-0140#B	F-FOS-00155
AM1-0140#B	F-TLM-10550
AM1-0140#B	F-TLM-10555
AM1-0140#B	F-TLM-10560
AM1-0140#B	F-TLM-10570
AM1-0140#B	F-TLM-10575
AM1-0140#B	F-TLM-10580
AM1-0160#B	F-TLM-00110
AM1-0160#B	F-TLM-00115
AM1-0225#B	F-ANA-04120
AM1-0225#B	F-FUI-02200
AM1-0225#B	F-FUI-02205
AM1-0240#B	F-ANA-04120
AM1-0240#B	F-FUI-02205
AM1-1000#B	F-FOS-00500
AM1-1060#B	F-TLM-01520
AM1-1080#B	F-TLM-11520
AM1-1090#B	F-FOS-00315
AM1-1110#B	F-TLM-00115

Attachment 6: Delete RBR/L4 Link

RBR_id	L4_id
~~AM1-0020#B~~	~~F-CMD-01165~~
~~AM1-0130#B~~	~~F-CMD-01125~~
~~AM1-0130#B~~	~~F-CMD-01130~~
~~AM1-0130#B~~	~~F-CMD-01135~~
~~AM1-0130#B~~	~~F-CMD-01165~~
~~AM1-0135#B~~	~~F-CMD-01130~~
~~AM1-0135#B~~	~~F-CMD-01135~~
~~AM1-0135#B~~	~~F-CMD-01165~~
~~AM1-0280#B~~	~~F-TLM-10125~~